

**WHAT IS CLAIMED IS:**

1. A method of treating a patient with a neurodegenerative disease characterized by extracellular plaques, the method comprising administering A $\beta$ , or an antigenic fragment or variant thereof, and a molecular adjuvant to the patient in an amount effective to improve one or more symptoms of the neurodegenerative disease.  
5
2. The method of claim 1, wherein the molecular adjuvant is tetanus toxin Fragment C.
- 10 3. The method of claim 1, wherein the molecular adjuvant is keyhole limpet hemocyanin.
4. The method of claim 1, wherein the neurodegenerative disease is Alzheimer's disease.  
15
5. The method of claim 1, wherein the A $\beta$ , or antigenic fragment or variant thereof, and the molecular adjuvant are administered by injection.
6. The method of claim 1, wherein the A $\beta$ , or antigenic fragment or variant thereof, and the molecular adjuvant are encoded by a nucleic acid.  
20
7. The method of claim 6, wherein the nucleic acid is contained within a plasmid, expression vector, or virus.
- 25 8. The method of claim 6, wherein the nucleic acid is contained within an amplicon.
9. The method of claim 8, wherein the amplicon is an HSV or HSVhf amplicon.
10. The method of claim 1, wherein the patient is a mammal.  
30
11. The method of claim 10, wherein the mammal is a human.

12. The method of claim 1, wherein A $\beta$  and the molecular adjuvant are admixed.
13. The method of claim 1, wherein A $\beta$  and the molecular adjuvant are chemically  
5 conjugated.
14. The method of claim 1, wherein A $\beta$  and the molecular adjuvant are fused.
15. The method of claim 14, wherein A $\beta$  and the molecular adjuvant are fused into a  
10 recombinant polypeptide.
16. The method of claim 1, wherein the symptoms comprise impaired memory,  
impaired thinking, disorientation, confusion, misplacing objects, impaired abstract  
thinking, difficulty performing familiar tasks, changes in personality, changes in  
15 behavior, impaired judgment, impaired ability to follow directions, impaired language  
skills, impaired communication skills, impaired visual skills, impaired spatial skills,  
loss of motivation, loss of initiative, or change from normal sleep patterns.
17. The method of claim 1, wherein the method further comprises administration of a  
20 conventional adjuvant.
18. The method of claim 17, wherein the conventional adjuvant is alum.
19. A pharmaceutically acceptable composition comprising A $\beta$ , or an antigenic  
25 fragment or variant thereof, a molecular adjuvant, and a delivery vehicle.
20. The composition of claim 19, wherein the molecular adjuvant is tetanus toxin  
Fragment C.
- 30 21. The composition of claim 19, wherein the molecular adjuvant is keyhole limpet  
hemocyanin.

22. The composition of claim 19, wherein the vehicle is a virus.
23. The composition of claim 22, wherein the virus is an HSV virus.
- 5 24. The composition of claim 19, wherein the vehicle is an amplicon.
25. An isolated nucleic acid comprising a sequence encoding A $\beta$ , or an antigenic fragment or variant thereof, and a sequence encoding a molecular adjuvant.
- 10 26. The nucleic acid of claim 25, wherein the molecular adjuvant is tetanus toxin Fragment C.
27. The nucleic acid of claim 25, wherein the molecular adjuvant is keyhole limpet hemocyanin.
- 15 28. A method of treating a patient with a neurodegenerative disease characterized by extracellular plaques, the method comprising administering to the patient
- 20 a. an amplicon plasmid comprising an HSV origin of replication, an HSV cleavage/packaging signal, and a heterologous transgene expressible in the host cell,
- b. one or more vectors that, individually or collectively, encode all essential HSV genes but exclude all cleavage/packaging signals, and
- 25 c. a vector encoding an accessory protein, wherein the transgene encodes a therapeutic protein that improves one or more symptoms of the neurodegenerative disease.
29. The method of claim 28, wherein the neurodegenerative disease is Alzheimer's disease.
- 30 30. The method of claim 28, wherein the transgene encodes a molecular adjuvant.

31. The method of claim 28, wherein the molecular adjuvant is tetanus toxin Fragment C.
- 5 32. The method of claim 28, wherein the molecular adjuvant is keyhole limpet hemocyanin.
33. The method of claim 28, wherein the transgene encodes A $\beta$ .
- 10 34. The method of claim 28, wherein the transgene encodes both A $\beta$  and a molecular adjuvant.
35. A composition for use as a medicament in treating a patient with a neurodegenerative disease characterized by extracellular plaques, wherein the composition comprises
- 15 a. an amplicon plasmid comprising an HSV origin of replication, an HSV cleavage/packaging signal, and a heterologous transgene expressible in the host cell,
- b. one or more vectors that, individually or collectively, encode all essential HSV genes but exclude all cleavage/packaging signals, and
- 20 c. a vector encoding an accessory protein, wherein the transgene encodes a therapeutic protein that improves one or more symptoms of the neurodegenerative disease.
- 25 36. The composition of claim 35, wherein the neurodegenerative disease is Alzheimer's disease.
37. The composition of claim 35, wherein the transgene encodes a molecular adjuvant.
- 30

38. The composition of claim 35, wherein the molecular adjuvant is tetanus toxin Fragment C.
39. The composition of claim 35, wherein the molecular adjuvant is keyhole limpet hemocyanin.
40. The composition of claim 35, wherein the transgene encodes A $\beta$ .
41. The composition of claim 35, wherein the transgene encodes both A $\beta$  and a molecular adjuvant.
42. Use of a composition for the manufacture of a medicament for use in treating a patient with a neurodegenerative disease characterized by extracellular plaques, wherein the composition comprises
- an amplicon plasmid comprising an HSV origin of replication, an HSV cleavage/packaging signal, and a heterologous transgene expressible in the host cell,
  - one or more vectors that, individually or collectively, encode all essential HSV genes but exclude all cleavage/packaging signals, and
  - a vector encoding an accessory protein, wherein the transgene encodes a therapeutic protein that improves one or more symptoms of the neurodegenerative disease.
43. The use of claim 42, wherein the neurodegenerative disease is Alzheimer's disease.
44. The use of claim 42, wherein the transgene encodes a molecular adjuvant.
45. The use of claim 42, wherein the molecular adjuvant is tetanus toxin Fragment C.

46. The use of claim 42, wherein the molecular adjuvant is keyhole limpet hemocyanin.

47. The use of claim 42, wherein the transgene encodes A $\beta$ .

5

48. The use of claim 42, wherein the transgene encodes both A $\beta$  and a molecular adjuvant.